Name:

ID:

CSCI 3104, Algorithms   **Profs. Chen & Grochow**
Quiz 6   **Spring 2020, CU-Boulder**
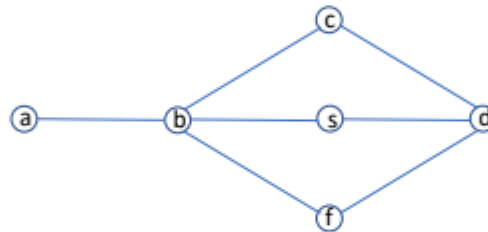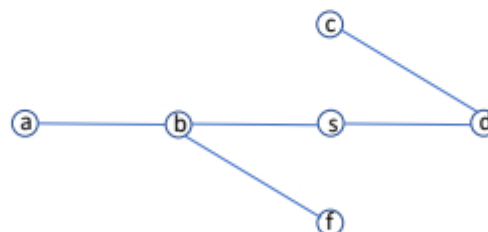
Instructions: This quiz is open book and open note, but **not** open-internet. You **may** post clarification questions to Piazza, with the understanding that you may not receive an answer in time and posting does count towards your 30 minutes. Questions posted to Piazza **must be posted as PRIVATE QUESTIONS.** Other use of the internet, including searching for answers or posting to sites like Chegg, is strictly prohibited. Any violation of the honor code is grounds to receive a 0 on this quiz. Proofs should be written in **complete sentences. Show and justify all work to receive full credit.**

Standard 14. *Consider the following graph with the source node s:*

Is it possible to obtain the following tree using BFS? Clearly justify your answer.

Solution: *This tree cannot be obtained using BFS with s as the root node. We note that the next vertices considered are b and d. If the algorithm considers b first, then the edges (b, c) and (b, f) are included in the tree. If instead the algorithm considers d first, then (d, c) and (d, f) are included in the tree. In both cases, (b, f) and (d, c) are not both included in the tree. So the above tree is not obtainable via BFS.*